



A FRAMEWORK FOR MANAGING ACTIVE RISK

Fiduciary Insights

ACCURATELY IDENTIFYING AND MANAGING ACTIVE RISK EXPOSURES IS ESSENTIAL TO FIDUCIARIES' EFFORTS TO ADD VALUE OVER POLICY BENCHMARKS WHILE LIMITING THE IMPACT OF UNINTENDED SHOCKS TO THE PORTFOLIO RETURNS. This paper presents a framework for distinguishing between market and active risk exposures.

Introduction

A governing committee faces numerous and diverse risks. Among them are the potential outright loss of capital, the possibility of not meeting desired investment objectives, and various governance risks (peer risk, the potential mismatch between portfolio returns and institutional needs and regulatory/legal risks). To complicate matters, the unfamiliar risks of new investment alternatives have emerged in recent years. Faced with this growing complexity, in order to add value and manage risks, fiduciaries need a clear view of their market risk exposures — and of the active risk exposures relative to market benchmarks taken by their investment managers.

A Risk Management Framework

The first goal of active risk management is to disentangle market from other active risks. Market risks can be characterized using capital market expectations of asset class returns, risks, and correlations. Each asset class is broken down into its structural components. For example, equities are subdivided by size, valuation characteristics, and geographic exposure. Fixed income is segregated into systematic sector (e.g., mortgage, credit) and interest rate sensitivities. Hedge fund risks are separated into a range of directional market exposures. Currency risks are distinguished from those of underlying investments in foreign markets.

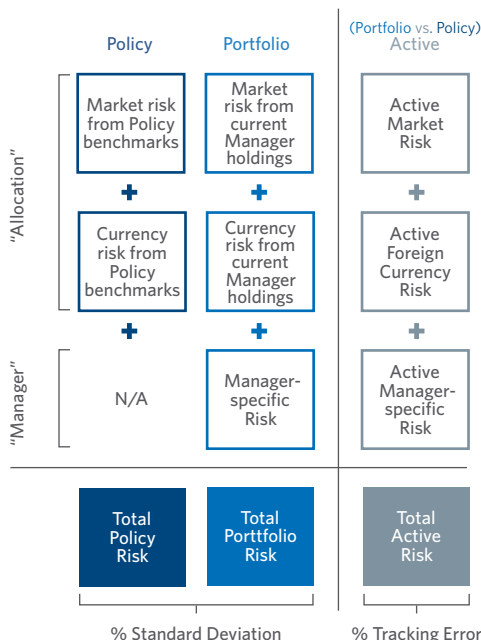
Identifying these dimensions of systematic market risk through factor models and holdings reports can help fiduciaries make well-informed active asset allocation and asset structuring decisions at the total portfolio level. The process also aids in evaluating the worth of active managers, all of whom to some degree produce market exposures that could otherwise be obtained more affordably through passive instruments.

The active risk produced by managers can therefore be parsed according to various sources. Manager decisions taken with regard to market, factor, spread, and currency risk exposures are one source of active risk. The residual, or uncategorized, risk that remains after accounting for embedded market and factor risks generally represents manager choices with respect to specific securities.

Illustrating the Framework

If we define the long-run strategic allocation chosen by investors as their *policy* and their current *portfolio* as the allocation after implementation through direct investments and through active managers, we can analyze active risks as shown in Exhibit 1.

EXHIBIT 1:
Sources of Active Risk



By definition, *policy* risks do not include active management.¹ They are viewed prospectively, and are measured in terms of standard deviations from an expected mean return.

¹ In the case of hedge funds, which are intrinsically forms of active management, a policy benchmark would typically be composed of a broad universe of particular active hedge fund managers.

Portfolio risks, also described in standard deviations, include the market, currency, and specific security exposures embedded in active managers' holdings, as well as active asset allocation and structuring decisions made at the total portfolio level. We refer to the combined market and currency exposures as *allocation risks* (these could be thought of as "beta" risks.) The remaining risks from specific security choices attributable to managers are referred to as *manager risks* (these could be thought of as "alpha" risks). Both policy and portfolio risks are measured in terms of standard deviations from an expected mean return.

Active risks arise from the expected mismatches between the performance of the actively managed portfolio and that of the long-term policy benchmark. As such, they are measured by "tracking error," which is the standard deviation of the difference between the performance of the active portfolio and that of its policy benchmark.

Applying the Framework to a Sample Portfolio

Exhibit 2 provides a specific example of the risk description of an actively managed sample portfolio allocated to equities, alternatives, and fixed income.²

So what do we observe about the expected risks of this portfolio?

- **Market risks dominate.** By definition, market risks dominate the policy portfolio. Effectively, the market risk dominates the sample portfolio as well. Of the total portfolio risk of 9.8%, 9.7% can be attributed to the market risk generated by manager positions. This is why asset allocation and asset class structuring are key to investment outcomes. Manager-specific factors do add risk, but most of that risk is explained by their identifiable market exposures.
- **The sample portfolio is defensively allocated.** At 9.8%, the sample portfolio's expected total risk is less than that of the

policy (10.5%). In this instance, the difference reflects underweights to equities and overweights to hedge fund investments of perceived lower risk. This defensive stance is consistent with more modest expectations for asset returns over the investment horizon of this portfolio.

- **Active risks are fundamentally different from absolute risk.** Observe that the active market risk in this example is 0.9%. This is not the difference between policy at 10.3% and portfolio at 9.7%. Likewise, the total active risk, at 1.4%, is not the difference between the policy total of 10.5% and portfolio total of 9.8%. This is because active risk is not calculated as policy risk minus portfolio risk. Rather, it is a bottom-up calculation – the aggregate impact of each of the portfolio's various "bets" versus the policy – which describes the expected deviation of actual portfolio return from the return of the policy.

Analyzing active risk enables us to isolate its major components. Manager-specific risk is naturally a larger slice of active risk than it is of portfolio risk – which, as we noted earlier, is dominated by absolute market risk.

EXHIBIT 2:
Active Risks in a Sample Portfolio

	Policy	Portfolio	(Portfolio vs. Policy) Active
"Allocation"	Market 10.3%	Market 9.7%	Market 0.9%
	Foreign Currency 0.2%	Foreign Current 0.1%	Foreign Currency 0.0%
"Manager"	N/A	Manager-specific 0.1%	Manager-specific 0.5%
	Total 10.5%	Total 9.8%	Total 1.4%
	% Standard Deviation		% Tracking Error

² For ease of interpretation, we have assigned values to the components of policy, portfolio, and active risks such that they add clearly to their totals. We have used the contribution to variance of each component to derive these values. This is necessary since standard deviations cannot be mathematically added.

Active Risk and Risk Budgeting

An actual portfolio seeking to outperform an investment policy reflects active risks embedded in investment opportunities, some more lucrative than others, and some more attractive at different times. Logically, the amount of active risk taken in a portfolio should be a function of available opportunities: their number, magnitude, and impact on total portfolio risk. In pursuing these opportunities, the portfolio should not stray too far from the investor's long-run risk profile, as enshrined in the investment policy.

To assist in managing within guidelines, a portfolio risk budget – or a plan for how to “spend” risk – is helpful. Risk budgets informed by our investment process typically place significant emphasis on identifying the active market and currency risks attributable to asset allocation and structuring decisions, whether made at the total portfolio level or by individual active managers. We expect the systematic market and structuring risks attributable to active asset allocation and structuring decisions to be the most determinative of ultimate volatility of return relative to benchmark. Referring back to the sample portfolio shown in Exhibit 2, it can be seen that active market risks (combining both asset structuring *and* allocation decisions) at 0.9% outweigh active manager-specific risks at 0.5%. It should be noted, however, that the balance between these different types of active risk will vary over time with the opportunity set available. When asset prices offer up few structural anomalies to be exploited, justifying relatively few active structural positions, manager-specific risk might be expected to account for a larger share of active risk.

This is not to say that manager-specific risks are not significant or that manager-specific value added is not well worth seeking. However, at the overall portfolio level, active manager-specific risks are dampened. If each investment process by which individual managers add value is unique, a portfolio of those managers will be extremely diversified and incorporate low aggregate manager-specific risk. This can be seen clearly in Exhibit 3, which shows the expected tracking error of equally weighted portfolios of active managers whose individual tracking errors are 1%, 3%, and 5%. As long as those managers' active risks are uncorrelated, even high levels of individual active risk are largely diversified away.

One objective of manager selection is to identify and employ managers with complementary skills. If this goal is achieved, the managers would take uncorrelated active risks, particularly at the level of security selection, resulting in a modest level of total active manager-specific risk. If the manager-specific risks are compensated and the managers add value, their contribution to portfolio return will come at a very low cost of risk. It is for this reason that the risk management process might accept and perhaps even seek significant active risk at the level of individual managers, but expect an outcome in which the bulk of the active risk at the total portfolio level relates to the market exposures, with the residual, security-specific risk having been largely diversified away.

Another way of thinking of the relative impact and value of allocation risk (the beta risk) and manager-specific risk (the alpha risk) is to note that allocation risk is generally characterized by a more episodic payment pattern and, when successful, a higher Sharpe ratio (excess return per unit of absolute risk), while manager-specific risk is generally characterized by a somewhat more consistent payoff and, when successful, higher information ratio (excess return per unit of tracking error to benchmark). Both forms of active risk can potentially add value, and they do so in a complementary fashion.

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EXHIBIT 3:
Portfolio Tracking Error as a Function of the Number of Uncorrelated Active Managers in the Portfolio

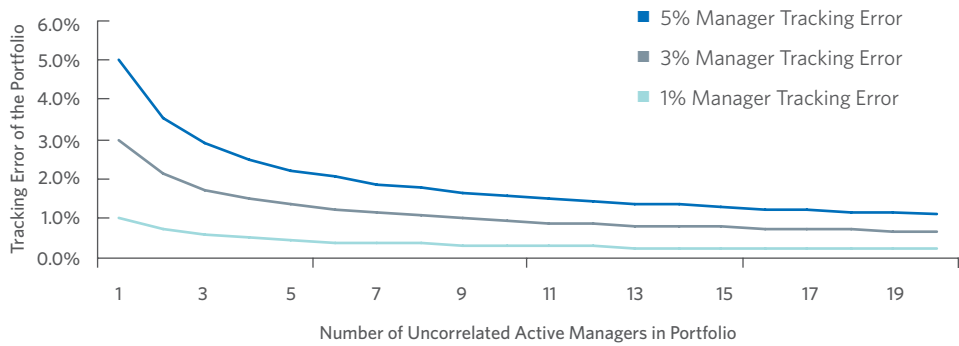


EXHIBIT 4:
Predicted and Realized Excess Portfolio Risk to Policy

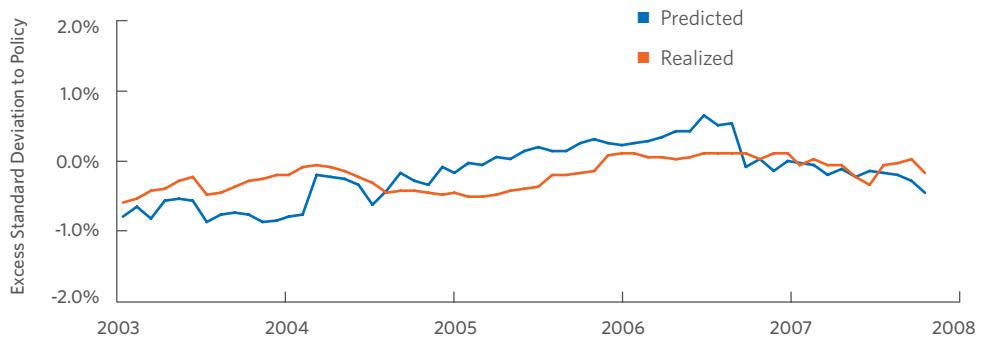
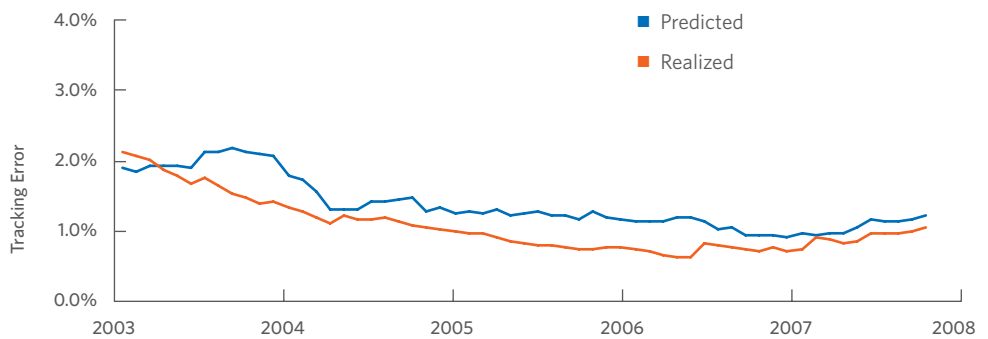


EXHIBIT 5:
Predicted and Realized Active Risk



Monitoring is an Integral Component of Risk Management

Conceptualizing and applying a risk management framework is a useful but limited exercise if the results from such a framework are not monitored frequently. Systems to calculate investment positions and forward-looking risks on a periodic basis are vital to this purpose, but must be supplied with relevant information. Managers must be willing to provide transparency so that their market, currency, and manager-specific risks can be disentangled and then recombined with capital market expectations to be evaluated in a portfolio context.

In the implementation of risk management, monitoring total active risk and its components is critical. In addition, forward-looking tracking error and excess risk to policy must be kept within acceptable ranges. If active asset allocation decisions are allowed, asset class weights must be maintained within declared acceptable ranges. Such monitoring helps prevent an asset mix from drifting and generating unintended risks.

Yet many risks elude detection by mechanical monitoring methods, especially risks of managers operating within the more opaque alternative asset classes. To identify these risks, more direct and detailed manager analysis is necessary. Moreover, managers' active risks are not always truly independent and diversifying. Other hidden risks lurk within financial instruments that are illiquid, asymmetric, or subject to counterparty risk. Capital market assumptions should also be held up to critical review, as they are built for equilibrium conditions and may not describe market risk relationships accurately in every

environment. Risk estimates quoted in standard deviations imply that returns follow a normal distribution, an assumption violated in volatile periods. In sum, data related to managers' characteristics and assumptions related to asset class and manager volatility and correlations must be continually tested.

Finally, to check the effectiveness of a risk management regime, the difference between expected and realized risks should be regularly evaluated. To illustrate, a comparison for the sample portfolio is shown in Exhibits 4 and 5, using a four-year horizon. The predicted excess risk to policy in Exhibit 4 was historically very similar to realized excess risk for the sample portfolio. Active risks were taken in amounts that influenced total portfolio risk, but not beyond expectations. Total risk was not overwhelmed by active risk.

The predicted and realized active risks shown in Exhibit 5 are also highly correlated. When more opportunity to add value was perceived and more active risk was intended to be taken at the portfolio level, more active risk was realized. The reverse was also true. So identifying active risk was informative to the investment process.

Exhibit 5 also illustrates that short-term trends in the risk environment should be monitored and understood, but that models should be adjusted with caution. During the first half of the time series shown in this exhibit, there is a reasonably wide spread between predicted and realized active risk, although their directional moves are similar. This period was a time of subdued overall market and cross-sectional security volatility and thus realized active risk was regularly lower than the predicted active risk based on equilibrium capital market assumptions. As markets became more volatile in the second half of the time series, realized active risk converged with expectations. An adjustment to the risk model to compensate for a short-term suppression of volatility might have resulted in risk budgeting decisions that would prove harmful when volatility returned to long-term equilibrium levels.

The difference between expected and realized risks should be regularly evaluated.

Conclusion

The identification and management of active risk is crucial to fiduciaries pursuing active management themselves and to investment managers hired to add value to a market benchmark. Fiduciaries should apply a framework to identify active risks taken in their portfolios, incorporating as much information from investment managers as possible. Managers should translate their investment processes into a hierarchy of expected added value and budgeted risks in order to manage risks taken more effectively. By monitoring, challenging, and ultimately improving the information from the application of this framework, fiduciaries can satisfy their risk management obligations.

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For more information, please email us at inquiries@strategicgroup.com.



1001 Nineteenth Street North
16th Floor
Arlington, VA 22209 USA

+1 703.243.4433 TEL
+1 703.243.2266 FAX

strategicgroup.com